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Intraspecific Variation in *Coluber viridiflavus* Lacépède, 1789, and validity of its subspecies (Reptilia, Serpentes, Colubridae)

by

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With 2 figures

ABSTRACT

A critical analysis of the variation of morphological characters in the European whip snake (*Coluber viridiflavus* Lacépède) does not justify subspecific recognition for any population. Most characters of this monotypic species vary independently and discordantly throughout the range. Pholidotic differences within the two principal colour morphs are greater than between populations of either of the two forms along "transitional zones". Furthermore, the situation in pattern and colouration (polymorphism) is not as simple as previously thought. Similar ecological conditions are responsible for the peculiarities of many insular demes, e.g. small body size, dark pattern and high subcaudal counts. Certain characters which allow easy distinction from *C. gemonensis* Laurenti are provided and nomenclatorial problems with regard to these species are discussed.

I. INTRODUCTION

The European whip snake (*Coluber viridiflavus*) is one of the most common snakes within large parts of its range. The systematic status of this species was not well understood at the beginning of this century (BOULENGER 1893, SCHREIBER 1912). Except for *Coluber caspius* Gmelin, melanism was known or presumed to occur in all forms included in *Zamenis gemonensis* (sensu Boulenger 1893). MÜLLER (1902) provided a good analysis of this problem with regard to the wholly European members (*C. viridiflavus*, *C. gemonensis*

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sensu Mertens & Müller 1928) of this group. He also formulated the restricted conception of *carbonarius*. His conclusions induced MERTENS (1921) to consider two subspecies of *C. viridiflavus* on the basis of different colouration and adult pattern. Following the current opinion (e.g. BRUNO 1975) there is a third valid race of the European whip snake (*C. viridiflavus kratzeri*) from the island of Montecristo (Tyrrhenian Sea).

The generic status of the *C. jugularis-viridiflavus* group within the bewildering genus *Coluber* (*sensu lato*) will be discussed in a forthcoming paper by the Swiss author. The scope of the present study is restricted to an investigation of intraspecific variation in *C. viridiflavus* and a critical consideration of the validity of its subspecies. Not only melanotic mainland populations of the European whip snake (WERNER 1929, BRUNO 1975 and 1980), but also those from several Tyrrhenian islands (LANZA 1972 and 1973) have been a matter of dispute and the subject of taxonomical discussions in the past decade. For this reason a detailed analysis of the morphology and distribution of *C. viridiflavus* seems desirable.

II. MATERIAL AND METHODS

650 specimens from the following collections were examined:

MHNG: Muséum d'Histoire naturelle de Genève.

MNHP: Muséum National d'Histoire naturelle, Paris.

MSNG: Museo Civico di Storia Naturale Giacomo Doria, Genoa.

MF: Museo Zoologico dell'Università, Florence.

NHMB: Naturhistorisches Museum Basel.

SMF: Senckenberg Museum Frankfurt/Main.

ZMZ/SS: Zoologisches Museum der Universität, Zürich.

The ventrals are counted by the DOWLING (1951) method. The pattern of scale row reduction is expressed in terms of total number of ventrals (averaged from both sides).

We want to express our thanks to the curators of the collections mentioned above and to Dr. D. Capolongo (Roccarainola/Naples), Jean Garzoni (Lausanne), Jan Haft (Baldham/Munich) and Gianfranco Lionetti (Matera) for their help in the field and supplying living specimens from interesting areas. Prof. E. Kramer (Muttentz) contributed valuable information and his critical reading influenced parts of the discussion section. Barbara Andrew translated the German text of the original manuscript.

III. RESULTS

3.1. SYNONYMY

Coluber viridiflavus Lacépède, 1789

Coluber viridiflavus Lacépède, 1789, Hist. nat. Serp., Tabl. méthod.: 137, pl. 6, fig. 1.
— Terra typica: Southern France.

Coluber vulgaris Bonnaterre, 1790 (not Razoumowsky, 1789), Tabl. encycl. méthod., Ophiol.: 28, pl. 38, fig. 3.

Coluber melanepis Rafinesque, 1814 (nomen oblitum), Préc. Découv. Trav. somiol.: 15.

Coluber viridiflavus carbonarius Bonaparte, 1833 (nomen conservandum), Iconogr. faun. ital. 2 (5): (25), pl. (3).

Zamenis viridiflavus ocellata de Betta, 1874, Faun. ital. 4: 42.

Zamenis atrovirens caudaelineata F. Müller, 1878 (nomen nudum), Verh. nat. Ges. Basel VI (4): 667 (note 31).

Coluber viridiflavus kratzeri Kramer, 1971, Lav. Soc. ital. Biogeogr. (n. s.) I (1970): 668.

Coluber viridiflavus antoniimanueli Capolongo, 1984, Atti Soc. ital. Sci. nat. Museo civ. Stor. nat. Milano 125 (3-4): 195.

An almost complete synonymy is found in MERTENS & WERMUTH (1960). *Coluber thermalis* [Desmarests & Cloquet] Mérat, 1822 (non Pallas, 1814) and *Coluber thermarum* Cloquet, 1823 are attributed to the European whip snake by BAUDRIMONT (1943); apart from being nomina nuda, these descriptions clearly refer to a species of water snakes (genus *Natrix*).

3.2. DISTRIBUTION

In Spain, *C. viridiflavus* is confined to the Pyrenees and spurs in the Basque region (Guipúzcoa, Vizcaya, Navarra), Aragonia (Zaragoza and Huesca) and Catalonia (Barcelona, Gerona and Lérida). This species is also known from Andorra (Les Escalles). According to ANGEL (1946) it is missing in some regions of central France but otherwise its distribution is south of a line from Nantes to Strassbourg. The occurrence on the island of Oléron is possible (BURNELEAU & DUGUY 1981). *Coluber viridiflavus* is also reported from the department of Ille-et-Vilaine (SELLIER 1945). According to ROLLINAT (1934) the whip snake is missing in the vicinity of Paris; MOUCHET (1950), however, mentioned this species from Fontainebleau. *C. viridiflavus* also occurs in the department of Aisne (MENU 1951). Recent records from the departments of Aube, Marne and Haute-Marne are given by NAULLEAU (1978). HEUERTZ (1954) reports it from Côte d'Or (region of Dijon), Doubs (Besançon), Haute-Saône (Vesoul), southern Vosges (Lamarche, Bains), Meurthe-et-Moselle (Nancy), along the Orne river from Verdun to Metz, Thionville and southwestern Luxembourg. An insular distribution up to Brabant (Brussels) is indicated by DE WITTE (1968a-c).

In western Switzerland indigenous populations are known only from the extreme southwestern parts of the canton of Geneva; other whip snakes found in this region (Allondon river; border of Lake of Geneva, Valais) originate from foreign populations and have been founded by animals introduced by amateurs. In southern Switzerland *C. viridiflavus* occurs in the cantons of Ticino (northwards to Faido in the Leventina and Aquarossa in the Blenio valley, respectively) and Grisons (Calanca valley, southern Engadin and Puschlav south of the Lake of Poschiavo). It is distributed in all Italy except the more elevated regions; the northernmost records are from the upper Adige valley and from Bressanone (DALLA TORRE 1912). *C. viridiflavus* does not occur in Austria. In Yugoslavia this species occurs only in western Slovenia, on Istria, and along the Dalmatian coast as

far south as Senj. It also inhabits the islands of Krk (Veglia), Veli Brijun (Brione Grande) and Palagruža (Pelagosa Grande) as well as San Domino and San Nicola (Tremi islands).

C. viridiflavus is very common on Corsica and also occurs on many surrounding islands and islets, including Cavallo, Farina, Forana, Giraglia, Gargalu, Lavezzi, Luigi Giamferri (LANZA & POGGESI pers. comm.), Mezzomare (= Grande Sanguinaria) and Piania (BODINIER 1981, DELAUGERRE 1983, LANZA 1972, LANZA & BRIZZI 1974, PARLANTI *et al.* in press). Italian islands inhabited by *C. viridiflavus* are: Sardinia, S. Antioco and Asinara, Budelli, Caprera, Corcelli, Maddalena, Molara, Razzoli, Santa Maria, San Pietro, S. Stefano, Spargi, Tavolara and Vacca (LANZA 1983, RANZI 1971, STEFANI 1971); Capraia, Elba, Giannutri, Giglio, Gorgona, Montecristo and Pianosa (Tuscanian Arcipelago, see VANNI 1977); Pontine islands (Palmarola, Ponza, Santo Stefano and Ventotene), Capri and Ischia; Islet of Cirella (Cosenza), Island of Sant'Andrea (Gallipoli); Sicilia, Eolian islands (Alicudi, Basiluzzo, Filicudi, Lipari, Panarea, Salina, Stromboli and Vulcano), Island of Ustica, Egeian islands (Favignana, Levanzo and Marettimo) and the neighbouring Isola Grande (BRUNO 1970, LANZA 1973). *C. viridiflavus* also inhabits Malta and Gozo Island (MERTENS 1921).

3.3. MORPHOLOGY

Pholidosis. The total range for ventrals in males and females is 187-211 and 197-227, respectively. Sexual dimorphism in ventrals is well pronounced. For subcaudals the values are 97-124 and 95-117 (Fig. 1).

The wide range for subcaudals in southern Italy (Fig. 1, F) is due to different clines in the various regions. Along the west coast (Naples to Reggio di Calabria) there is a continuous increase from 108.7 to 111.6 in males (means) and from 106.3 to 108.8 in females, respectively. On the Adriatic side south of the Gargano peninsula, including Lucania (Basilicata), the values are 104.2 (♂♂) and 100.8 (♀♀). The range for each region, however, is rather broad. Four specimens from the small Island of S. Andrea (Gulf of Taranto, Gallipoli), for example, have 95-110 subcaudals. For Sicily the values are lower than in the other islands of group G (Fig. 1), e.g. 108-119 (114.1) in ♂♂ and 104-110 (107.8) in ♀♀. The same complex situation is found for ventrals in the different regions of groups G and F. Taking this into consideration, there is no overlapping between the sexes in this character. Our sample from the Tremi islands and Pelagosa Grande is rather small; ♂♂ (4) have 196-202 (200.8+3.2) ventrals and 109 subcaudals (only one specimen with entire tail), the range in ♀♀ (4) is 204-211 (208.0+3.4) and 98-104 (100.3+3.2), respectively.

Anal plate divided (entire in a few cases only). 8 Supralabials, exceptionally 6-9, because of abnormal fusion or division; in one case (MF 7778, Toscana) there are only 4 (right) and 5 (left) supralabials. Fourth and fifth upper labial enter orbit; third, third and fourth or fifth and sixth in those specimens with irregular conditions. Preocular single, few exceptions from normal number (2) in postoculars, ranging from 1 to 3. Variation in temporal from 1+1 to 3+3, normally 2+2 or 2+3. In 8% of the Tuscanian specimens there is only one anterior temporal (see also ROUX 1939). Infralabials 8-11, generally 10. Dorsal scales at midbody invariably in 19 rows. No geographical variation or sexual dimorphism in scale row pattern; increase (17-19) between 0.15 to 0.22, reductions from 0.56 to 0.60 (19-17) and 0.64 to 0.72 (17-15), respectively.

Lengths and proportions. On average, ♂♂ attain somewhat longer dimensions than do ♀♀ but there is only a slight difference in maximum length records (Fig. 1). We did not notice general differences between smaller and larger islands in the maxima attained.

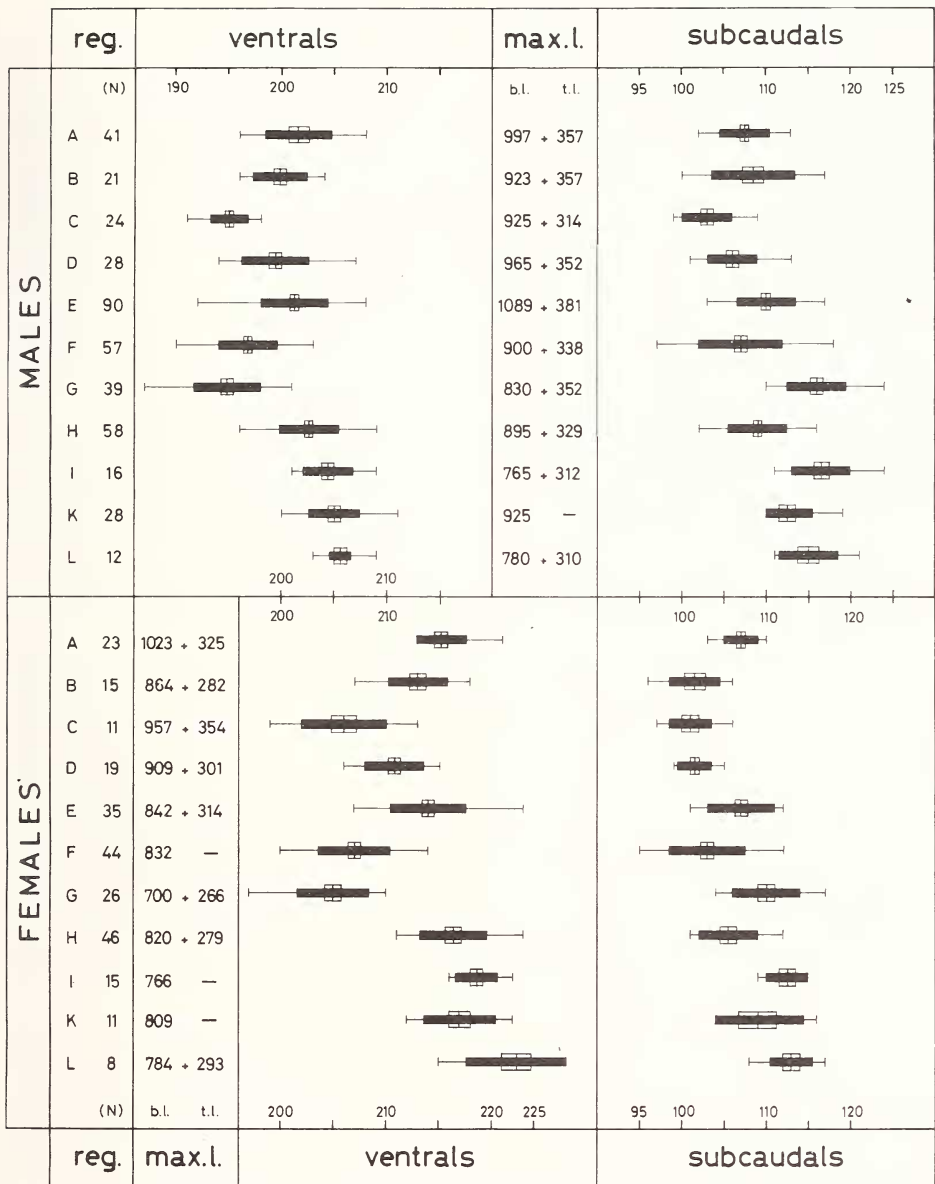


FIG. 1.

Ventrals, subcaudals and maximum lengths in *C. viridiflavus*: Spain, France, Belgium, Luxemburg and western Switzerland (A); Liguria, Piemont, Lobardia and Ticino (B); Trentino, Venezia, Friuli and northwestern Jugoslavia (C); Emilia-Romagna (D); Tuscany, Marche-Umbria, Latium, Molise, Abruzzi (E); Campania, Puglia, Basilicata, Calabria (F); Sicily, Malta (G); Corsica, Sardinia (H); Montecristo (I); Toscanian Archipelago (K); Pontine islands, Capri, Ischia (L). Number of specimens (N), range (horizontal line), mean (vertical line), standard deviation (black bar), standard error (right angle); body length (b. l.), tail length (t. l.) (measurements in millimetres).

From Krk (Veglia) we have a male (ZMZ/SS 135) with a snout/vent length of 892 mm, a male from the Tremiti islands (MF 7790) has 844 mm. Tail/body length ratio 0.32-0.44.

Pattern and colouration. The pattern of *C. viridiflavus* is characterized by an ontogenetic change and polymorphism in adult colouration. Specimens with 1 m total length normally have the adult colouration. No apparent geographical differences have been observed in juvenile pattern. In very young specimens, only parts of the head are distinctly yellow, the remaining parts of the body being olive to light-brownish with irregularly outlined transverse bars on the anterior parts of the body. The darkening of the ground colour, and development of the yellow markings on the dorsal scales, as well as the striping of the tail and ventral pattern (see below) vary even within the same population. Melanotic specimens usually have the livery entirely black but occasionally some head scales (supralabials, chin shields) retain a certain amount of light (whitish) colouration. True melanotic populations are found in northeastern Italy, Yugoslavia and in the southernmost parts of the range (Calabria, Sicilia and Malta).

Specimens from the Emilia-Romagna are variable in colouration and show every transition between «*carbonarius*» and the «typical» *viridiflavus*-form of southern France, north-western Italy, Tuscany, Umbria and Latium. These populations have a brilliantly black ground colour and bright yellow markings on the dorsal scales which are confluent on the posterior parts and give the impression of a striped tail. On the mainland, sporadic records of melanotic specimens are known from the Adriatic versant of the Apennines in central Italy (e.g., Marche). Specimens with an olive livery in otherwise melanotic populations occur in Apulia (Gargano) and Basilicata (Matera).

In general appearance the populations from the Tyrrhenian Sea are similar to those from the surrounding mainland. They have, however, reduced amounts of yellow and the pattern on the anterior parts of the body resembles those of immature specimens in certain melanotic mainland populations. Especially on the smaller islands the markings on the dorsal scales are reduced in size and brownish instead of yellow, or the specimens are rather dark and faintly patterned. From Capraia, for example, almost uniform dark specimens are known. On Sardinia and Corsica the situation is very complex and gives clear evidence for polymorphism; specimens with the striking pattern of «typical» *viridiflavus* occur together with rather dark ones and occasionally melanotic specimens occur. The populations from the Pontine islands, Capri and Ischia resemble those from the transitional zone in the Ferrara-Ravenna area. Specimens from Pelagosa Grande (Adriatic Sea) are similar to those from the Tuscanian archipelago.

Geographic variation is also found in ventral pigmentation. In adults of «typical» (black and yellow) populations, the belly is normally uniform yellow with more or less abundant black spots; this pattern is especially well pronounced on the anterior parts of the venter. Melanotic specimens have the ventrals with dark grey or black edges, and the mid-parts dirty yellowish. In the transition zone (Emilia Romagna) many specimens exhibit a variable mixing of dorsal and ventral pigmentation proper to the melanotic or patterned form. On the island of Krk one of the authors (BS) observed an adult (black) specimen with a salmon red venter. This peculiarity was recorded in a specimen from Istria by MÜLLER (1878).

Dentition. No geographical variation is found in the dentigerous bones. The maxillary has 13 (12-14) + 2 teeth; the diastema separating the last two teeth is perceptible but not very distinct, the ulteriormost tooth is offset laterad. Palatinum with 9-11, pterygoid 15-20, and dentary 15-18 teeth.

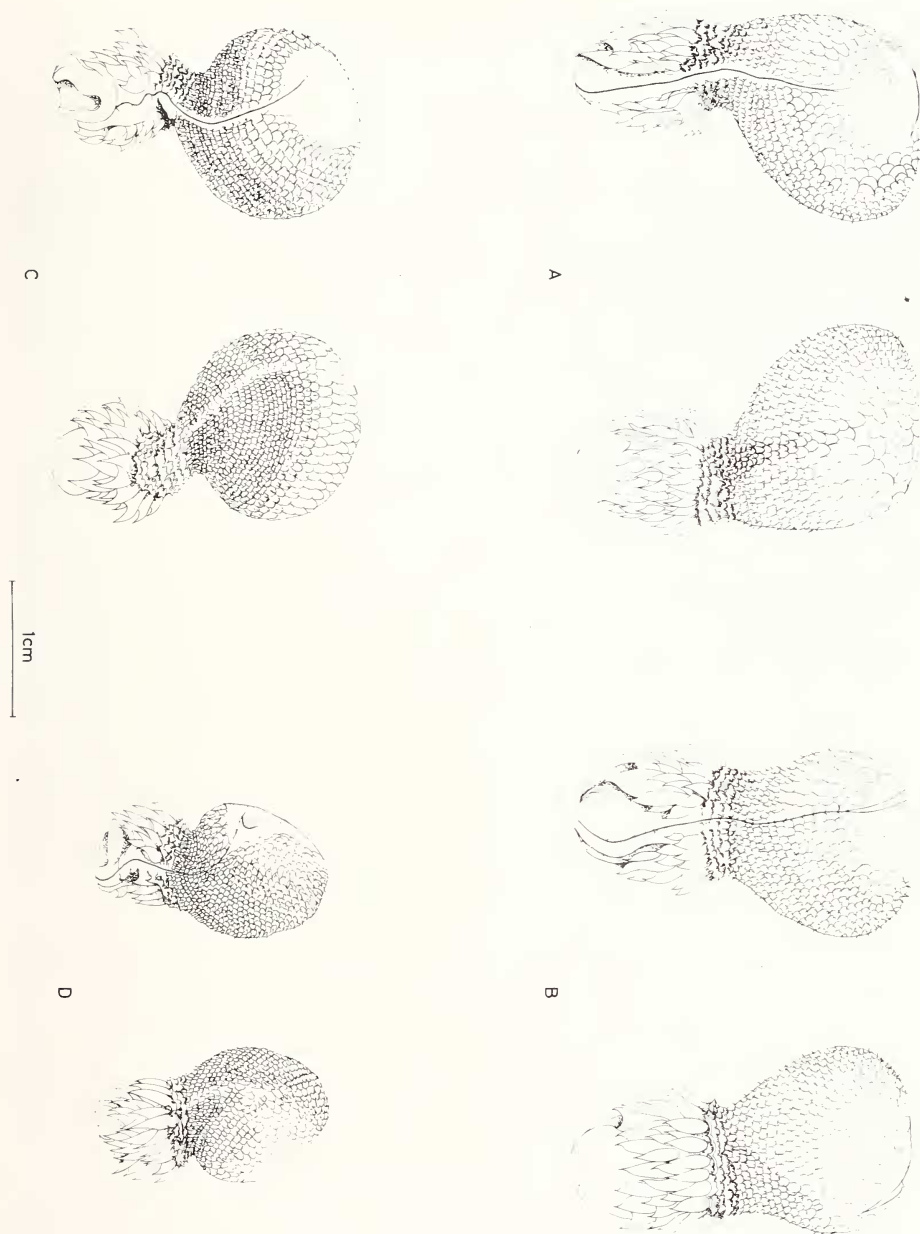


FIG. 2.

Right hemipenes in *C. viridiflavus*: (A) Putignano, Apulia (ZMZ/SS 18); (B) Deux-Sèvres, France (ZMZ/SS 57); (C) Krk, Yugoslavia (ZMZ/SS 134); (D) Montecristo (ZMZ/SS 114).

Hemipenis. Bulbous, with single sulcus spermaticus; basal portion with distinct spines, apex calyculated (Fig. 2).

IV. DISCUSSION

BRUNO (1975 and 1980) considers that the two principal colour morphs of *C. viridiflavus* could represent distinct species. This opinion is based on sympatric occurrence and alleged differences in pholidosis. In both sexes there is a general increase in ventrals from south to north with the exception of the northeastern parts of Italy where the values are low and similar to those from Sicily and Malta (Fig. 1). For this reason melanotic populations have somewhat lower counts than have «typical» *viridiflavus* (black and yellow) populations. Black specimens from northern and southern Italy, however, differ in subcaudals.

The diagnostic characters given for *C. v. kratzeri* are within the range of variation found in this species. The snakes from Montecristo cannot be distinguished from those of other islands in the Tyrrhenian Sea. High subcaudal counts, for instance, are also characteristic for southern populations on the Italian peninsula and Sicily. Not all island populations have more subcaudals than adjacent mainland whip snakes (e.g., Corsica and Sardinia, see Fig. 1; CAPOLOGO 1984). Small body size is a poor taxonomical character and likewise common in many insular snakes (MERTENS 1934). Small average length and slenderness are not only found on Montecristo (KRAMER 1971) but also on other islands (MERTENS 1967, BRUNO 1975). The maximum lengths attained by some populations (Fig. 1, I-L) are considerably greater than previously recorded. On the other hand, STEWARD (1971), ARNOLD & BURTON (1978) and STREET (1979) report almost 2 m as maximum length for this species. A specimen with 1,5 m is known from Losone, Ticino (KRAMER, pers. comm.). SOCHUREK (1957) and BRUNO (1980) mention specimens with 1,6 and 1,75 m from northern Italy and for Sicily BRUNO (1970) gives a maximum record of 1,7 m. More than half of the specimens examined by him exceed our values and the data in Fig. 1 probably do not reflect the maximum lengths attained by *C. viridiflavus*. For northwestern Italy, central France and Luxemburg the literature records do not exceed 1,35 m (CAPOCACCIA 1959, ROLLINAT 1934, HEUERTZ 1954).

The most complex situation in *C. viridiflavus* is in pattern and colouration. MÜLLER (1902) realized that the length at which the adult pattern is fully developed varies considerably even within the same population. ROLLINAT (1934) mentions females which retain their juvenile colouration throughout life. Populations from the islands surrounding Sicily are normally black; on Vulcano, for example, many specimens are sombre on the back but they exhibit greyish transverse bars on the neck. In other island populations the general ground colour is dark olive to brownish-black and there is almost no contrast with the pattern on the scales, due to a fading of the yellow stripes. This type of pattern is also described by MERTENS (1934) for Pelagosa (Palagruža, Adriatic Sea). MÜLLER (1974) reports "hybrids" from the Lake of Barrea (Abruzzi) and BRUNO (1982) gives "intermediate morphological characters" for specimens from Mt. Pollino (Basilicata/Calabria). The absence of the melanotic pattern in a collection from southern Tyrol (DALLA TORRE 1912) can only be explained with inadequate sampling (no adult specimens). The polymorphism in pattern is especially clear on Corsica and Sardinia and in those cases where normal colouration has been found in adult specimens within otherwise entirely black populations, or vice versa (BRUNO 1970, CAPOLOGO 1984, and others). In the surroundings of Matera (Basilicata) we found uniform olive and entirely melanotic specimens

of more than 1 m total length in the same biotop (syntopic). For a detailed analysis of ventral colouration see VANNI (1982).

Melanotic specimens are unknown in *C. gemonensis* with the exception of an insular subspecies (*C. g. gyarusensis*). This form differs from the nominal subspecies in considerably higher ventrals (MERTENS 1968). Differences in pholidosis and a darkening of the colouration can be observed in many insular snakes (MERTENS 1934: 91f.). Melanotic subspecies of *C. constrictor* (*constrictor*, *helvigularis* and *priapus*) are primarily associated with forested regions (AUFFENBERG 1955: 112) but in *C. viridiflavus* ecological factors affecting the colouration and pattern cannot be found. In many areas, the European whip snake goes up to more than 1400 m (MERTENS 1925, KNOEPFFLER 1961, DOLCE 1979). MÜLLER (1974) found this species at 1820 m (Lake of Barrea, central Italy) but in central France ANGEL (1946) reports its absence above 700 m. On the other hand, this species does not occur below 300 m in the Provence (KNOEPFFLER 1961) and 600 m in the Languedoc (LIVET & BONS 1981); the latter authors argue that this is presumably due to competition with *Malpolon monspessulanus* (Hermann). In fact, the eastern limit of distribution of *C. viridiflavus* and the northwestern range of the Montpellier snake in the Balkans do not overlap except in a very small area. Sympatric occurrence of *C. viridiflavus* and the related Balkan whip snake (*C. gemonensis* Laur.) is restricted to Dalmatia (Senj, Krk), Istria and the uppermost Val Rosandra (BRUNO *et al.* 1973, DOLCE 1979). In this area, adult specimens of *C. viridiflavus* are always black and can easily be distinguished from *C. gemonensis*. The two species differ also in scutellation; there is no overlap in ventral counts. *C. g. gemonensis* from the Balkans have 163-171 (167.3 ± 2.2) ventrals and 94-105 (101.3 ± 3.3) subcaudals in $\sigma\sigma$ (23 specimens); the value for $\varphi\varphi$ (11) are 169-182 (175.4 ± 4.4) and 91-100 (95.6 ± 3.0), respectively. Furthermore, *C. g. gemonensis* has more maxillary teeth (16-19) and lacks a diastema.

We cannot understand the reasons which induced WERNER (1929: 70) to assign *carbonarius* to *C. gemonensis* (sensu Mertens & Müller 1928). The minimum (180) given for ventrals in *viridiflavus* (sensu Werner) can probably be referred to BONAPARTE (1840). The value for *gemonensis* (126) is a misprint for 162 (WETTSTEIN 1953). To judge from the actual distribution in Dalmatia which gives rise to the opinion that there is considerable competition between *C. gemonensis* and *C. viridiflavus*, and the fact that the range of the latter certainly has not altered very much during the past 200 years, we consider the type locality of the Balkan whip snake (Gemon, Friuli) as extremely doubtful. Notwithstanding statements to the contrary (BRUNO 1968, but see comment in BRUNO *et al.* 1973), we do not agree with MERTENS (1968) in what concerns a former occurrence of *C. gemonensis* (Laurenti) in the Julian Alps. Except for the Val Rosandra (see above), all the alleged *C. gemonensis* from Italy that we found in collections (e.g., SMF 60736 and 68959, both juveniles) actually turned out to be *C. viridiflavus*. It is highly probable that the presumably lost type specimen of *Natrix gemonensis* Laurenti was a juvenile of *C. viridiflavus* Lacépède.

BRONGERSMA (1972) has argued that the work by LACÉPÈDE (1789) should be placed on the Official Index of Rejected Works in Zoology (see also SAVAGE 1981). We concur with MERTENS (1968) that *Natrix gemonensis* Laurenti, 1768 should not be referred to the European whip snake (*C. viridiflavus*) in the interest of stability of nomenclature. We prefer to await a revision of related Palearctic forms and a critical analysis of *C. gemonensis* until further measures in this field have to be taken. In spite of some reservations it seems most appropriate to declare *Natrix gemonensis* Laurenti, 1768 as a nomen dubium. *Zamenis atrovirens dalmatina* Müller, 1878 is a nomen nudum. The oldest valid name for the Balkan whip snake is *Coluber laurenti* (Bedriaga 1881).

RIASSUNTO

L'analisi critica dei caratteri morfologici di 650 esemplari di Biacco o Colubro verde e giallo (*Coluber viridiflavus* Lacépède) ha mostrato che questa specie deve essere considerata monotipica. La maggior parte dei caratteri presi in esame varia indipendentemente e in maniera discordante attraverso l'areale della specie. Le differenze di folidosi all'interno delle due principali varianti di colorazione sono più elevate che fra le popolazioni di ciascuna delle due forme lungo le «zone di passaggio». Per di più la situazione circa il disegno e la colorazione (polimorfismo) non è così semplice come può apparire dai dati della letteratura. Le popolazioni insulari hanno alcune caratteristiche morfologiche in comune (piccola taglia, colorazione più scura, maggior numero di sottocaudali), dovute a condizioni ambientali simili. Sono forniti alcuni caratteri che permettono una facile distinzione dall'affine *C. gemonensis* e vengono infine discussi problemi nomenclaturali relativi a *C. viridiflavus* e *C. gemonensis*.

ZUSAMMENFASSUNG

Eine Untersuchung der Variation morphologischer Merkmale von 650 Exemplaren der europäischen Zornnatter (*Coluber viridiflavus* Lacépède) rechtfertigt keinen subspezifischen Status für einzelne Populationen. Die meisten Merkmale streuen unabhängig voneinander und gemeinsame Gradienten fehlen für grosse Teile des Verbreitungsgebiets. Unterschiede in den Beschuppungsmerkmalen innerhalb der beiden vorherrschenden Zeichnungsformen sind grösser als zwischen den Populationen zu beiden Seiten der „Übergangszone“. Hinsichtlich Zeichnung und Muster (Polymorphismus) ist die Situation im übrigen keineswegs derart einfach wie häufig in der Literatur dargestellt. Inseldeme zeigen einige gemeinsame Merkmale (schlanker Körperbau und geringere Maximalgrössen, düstere Zeichnung, hohe Subcaudalwerte) als Anpassung an ähnliche Lebensräume. Die Arbeit liefert einige Merkmale zur einfachen Unterscheidung von *C. gemonensis* und nomenklatorische Probleme im Zusammenhang mit diesen beiden Formen werden diskutiert.

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